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Review on: Groundnut and its Production Status in Tamil Nadu

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ABSTRACT:

We studied various research articles related to trend analysis area, production and productivity in relation to climate change of Groundnut in Tamil Nadu. These articles explained about the importance of groundnut and its cultivation over a period of time. It is the third-largest oilseed crop in the world. India ranks second in terms of output and first in terms of crop area in the world. The major groundnut growing districts in Tamil Nadu are North Arcot, South Arcot, Salem, and Coimbatore. Drawing statistical data on production of groundnut during the year 2018-2019, it states that the area and production in Tamil Nadu is decreasing. Research articles were mostly based on the statistical data collected from various primary and secondary sources. These data were helpful to predict the future trend in area, production and productivity of groundnut in relation to climate change over Tamil Nadu.

Key Words: Groundnut, DSSAT(Decision Support System for Agrotechnolgy Transfer), Production, ARIMA.

INTRODUCTION:

The groundnut is the worlds 13th most essential food gather. Among number of oilseeds, groundnut production is higher as 25% than othersThe major groundnut growing districts in Tamil Nadu are North Arcot, South Arcot, Salem, and Coimbatore. It is found that there are no severe fluctuations in rainfall and there is a drastic change in groundnut production over the years. The total production came down from 1250 lakh tonnes to 890 lakh tonnes. The data reveals that inspite of sufficient rainfall the volume of production has come down. It has been found that the decrease in area under groundnut cultivation in almost all around the districts of Tamil Nadu. The study states that In Tamil Nadu drought as major problem as it affects the groundnut production.Agriculture is highly dependent on specific climatic conditions. The effects of climate change should be considered along with other developments in agricultural production. Climate change may sometimes increase productivity of some crops but decrease their quality. In developing countries like India the effects of climate change on agriculture and food supply is more as options in crop management and irrigation are limited. The area under cultivation has reduced. It is high time for both the people and government to understand the intensity of the problem and come out with right measures to mitigate the problem. So government should take appropriate steps.

In the article Impact of Drought on Groundnut Productivity Over Tamil Nadu

The authors reported the Impact of drought on Groundnut productivity over Tamil Nadu. Globally agriculture is mainly dependent on climate and weather. The deviation from the normal weather including drought, flood, heat waves and cold waves affects the yield of agricultural crops. Environmental impacts were evaluated by crop Simulation model to quantify the yield gap between the potential yield and actual yield. The materials and methods used by the authors to assess the impact of drought on Groundnut productivity over Tamil Nadu are Description of the study area, Historic climate data source, Impact of drought on climate productivity, Simulation of crop yield using DSSAT (Decision Support System for Agrotechnolgy Transfer), weather file, soil data file, Experimental

detail fail and genetic coefficient. And, they mentioned outputs from the model are used for understanding drought influence on productivity of maize, groundnut and cotton across the districts in Tamil Nadu except Chennai and Nilgiris. In most part of Tamil Nadu higher crop productivity was noticed under excess rainfall situation and lesser productivity observed under deficit condition. As Tamil Nadu is located in the tropical climatic condition the crops productivity is mainly limited by water availability. For the rainfed situation, the only source of moisture for crop production is rainfall hence, if the rainfall is normal or above normal with good distribution, cops productivity is enhanced. The study was carried out at the Tamil Nadu Agricultural University, Agro climatic researchCentre, Coimbatore. The authors reported seven districts of Tamil Nadu come under moderate productivity index and nine districts has high productivity index. The rainfall deviation on Groundnut growth rate were correlated and the result shows there is a linear influence of rainfall on Groundnut growth rate.They mentioned the major production states of groundnut are Gujarat, Andhra Pradesh, Karnataka, Tamil Nadu and Maharashtra. The 5 states contribute 86% of groundnut production in India .Tamil Nadu, occupies 338300 hectares with a production of 782300 tonnes. The major groundnut producing districts are Vellore, Cuddalore, Thiruvannamalai, Dharmapuri, Salem, Erode, Theni, Trichy, Madurai, Perambalur, Ariyalur, Pudukkottai and Kancheepuram districts,

In this paper Enyedis method is used to calculate the productivity index. This report concluded Groundnut production in India plays major role in edible oil economy of our country. Among nine oilseed crops, ground contributes about 55 percent total oil seed production. By using this method Tamil Nadu is classified into three regions viz, low productivity regions, high productivity regions and moderate productivity regions. Basically they are three quantile the first quantile (25%) is a lower quantile, 50 percent is called second quantile and third quantile (75%) is known as upper quantile. They reported the the yield of groundnut in all districts of Tamil Nadu.

EFFECT OF CLIMATE CHANGE ON YIELD OF GROUNDNUT

How climate change affects the yield of groundnut. Climate change is closely linked with atmospheric concentration of CO2, methane, nitrous oxide and other green house gases which are known to trap the heat from solar radiations. As the concentrations of green house gases increase, the overall temperature also increase resulting in differential precipitation leading to abrupt variation in crop productivity. These changes in climatic factors (CO, temperature, rainfall, deficit) will alter the plant growth and development processes and most likely have negative impact on crop productivity, especially in the semi-arid tropical regions, where the current temperatures are already high and close to the upper limits beyond which the plant processing will be adversely affected. Therefore, inspite of some expected benefits of increased CO2 concentration on some crops, global warming poses a potential threat to agricultural production and productivity throughout the world. Impact of climate change on agriculture will be one of the major deciding factors influencing the future food security of mankind on the earth. Climate change studies over the past few decades have mostly focused on regional and local scales which are of paramount importance in assessing the impacts of climate change on agriculture. To assess the impact of climate change in agriculture over Tamil Nadu, outputs of PRECIS Regional Climate Model and DSSAT crop simulation model were used.

The materials and methods used are Climate model, Crop simulation model, Calendar calculation for precise data. The assumption made in DSSAT are the chemical fertilizers and water was considered as not limiting, There was no major pest and disease attacked the crop, Three sowing dates were assumed as 5th June, 5thSeptember and 5th December for kharif, rabi and winter respectively, to average the effect of sowing window The diverse varieties, irrigation and fertilizer practices were not considered and they were assumed to be same. The simulated yield for predicted projections revealed that there no perfect trend of increase or decrease in the yields over the decadal interval studied for June and September sown crop. It varied from year to year and the maximum was observed during the year 2008 (Table 2) and a near stabilized yield state was seen from the year 2028 but it was not continuous but for December sown crop this decline was lesser than that of the other seasons where the difference

was higherthe technical efficiency in groundnut production and how it helps in increasing the yield of groundnut in Tamil Nadu. Groundnut is an important oilseed crop grown in tropical areas of the world. It is the third-largest oilseed crop in the world. India ranks second in terms of output and first in terms of crop area in the world.

Drawing statistical data on production of groundnut during the year 2018-2019, it states that the area and production in Tamil Nadu is decreasing. They carried over a field survey randomly and collected the primary data of those samples. The random sampling technique was used to collect the sample data. The total sample size for the study was 100. Villupuram and Tiruvannamalai districts were chosen based on the largest area under groundnut cultivation in Tamil Nadu. Similarly, Thiruvennainallur and Vikkiravandi blocks in Villupuram district and Kilpennathur and Thandarampattu blocks in Tiruvannamalai district were selected based on the largest area under groundnut Cobb-Douglas production function and stochastic frontier production function were used to analyze the data. The results of the stochastic frontier production function revealed that seeds, fertilizers and plant protection chemicals were significantly influencing the technical efficiency of the groundnut production. and the article gave the result of increase in the use of inputs like seeds, fertilizers and plant protection chemicals could increase technical efficiency. Further, the elasticity of human labour and bullock labour inputs were negative and statistically insignificant. It was found that the efficiency of groundnut farmers ranged from 67.41 to 99.86 per cent with a mean technical efficiency was 88.06 per cent.

The decadal growth of groundnut production in Tamil Nadu and the relationship between area, production and rainfall in groundnut. The study has been conducted based on secondary data. The secondary source of data include Statistical Handbook of Tamil Nadu, Statistical Abstract of Tamil Nadu, Magazines, Bulletins, Journals and various websites. In Tamil Nadu four oil seeds crops are grown namely Groundnut, Sesame, Sunflower and Castor. Groundnut occupies 81% of the area and 91% of the production. Even though it is predominantly grown rained crop (68%) in the state the productivity is higher (1957 kg/ha) i.e. next to Gujarat (2235 kg/ha) in India (2007 – 2008).

A study was carried out at the Tamil Nadu Agricultural University, Agro Climate Research Centre, Coimbatore during the period of 2019 to identify the productivity index for groundnut in Tamil Nadu. The secondary data on production, area and productivity on groundnut crop was collected from Department of Economics and Statistics, Chennai and Statistical Hand book of Tamil Nadu for 15 years for period from 2000 to 2015. In this paper Enyedi's method was used to calculate the productivity index. From the study it is found that in Tamil Nadu, seven districts were identified as low productivity index, sixteen district comes under moderate productivity index and nine district has high productivity index. The rainfall deviation on groundnut growth rate were correlated and the result shows there is liner influence of rainfall on groundnut growth.Groundnut crop can be cultivated in region were rainfall received from 500 to 1250 mm of rainfall . It cannot withstand severe drought, water logging and frost. The major groundnut production states are Gujarat, Andhra Pradesh, Karnataka, Tamil Nadu and Maharashtra. These five states contribute 86 percent of groundnut production in India . Tamil Nadu, occupies 338300 hectares with a production of 783200 tonnes .The major groundnut producing districts are Vellore, Cuddalore, Thiruvannamalai, Dharmapuri, Salem, Erode, Theni, Trichy, Madurai, Perambalur, Ariyalur, Pudukkottai and Kancheepuram district . The main season for cultivation in January (Thaipattam).The high productivity is attained due to nature of climatic factors, soil type, improved crop management, introducing of high yield varieties. There may be some fluctuation in some regions due to adaptations of poor technology, maintaining poor plant population, adapting to new crops, inadequate fertilization, socio-economic status of farmers and Monsoon variations which cause major fluctuations in groundnut production .

Rainfall variability proves to be an influential factor in the yield component of a crop. As Tamil Nadu is located in the tropical climatic condition, the crops productivity is mainly limited by water availability. For the rainfed situation, only source of moisture for crop production is rainfall. Hence, when there is normal or above normal

rainfall with even distribution, it leads to increased crop productivity. Simulation models are the most reliable tool for assessing drought on Crop production and determine drought stress patterns on crops. CROPGRO-Groundnut model embedded in DSSAT 4.6 was employed to simulate the productivity of groundnut for 37 years (1981-2017) that is grown between June to September in Tamil Nadu and productivity was compared between Deficit, Normal and Excess rainfall years.

The results revealed that the average yield of rainfed groundnut was greater for excess rainfall years (2166 kg ha-1) followed by normal (1772 kg ha-1) and deficit years (1161 kg ha-1). The coefficient of variation in groundnut Productivity was high during deficit (10 %) years compared to excess (5 %) And normal (3 %) years. Observation of this article is higher productivity of rainfed crops under excess rainfall years and lower productivity under deficit conditions highlights the critical role of water availability in agricultural productivity and the need for effective water management strategies in rainfed.

Reddy (1934) reported that among the edible oilseeds groundnut is the most important one accounting for 46 per cent of the total area under oilseeds, about 67 per cent of the total oilseeds production or about 59 per cent of the total edible oil production in the country.

Lipton (1970) studied about fluctuations in areas and arrived at the conclusion that these fluctuations would adversely affect the production to a considerable extent. Therefore, it is necessary to determine the factors governing the production of groundnut.

Jhala (1980) estimated yield-rainfall relationship for groundnut regions at all-India level and found that there was a strong decisive influence of weather on groundnut yield and also formulated an econometric model for forecasting short term supply and demand for determining price of edible oils and oilseeds.

Naidu (1984) analysed the impact of area, rainfall and prices on production of groundnut in Andhra Pradesh and suggested the need to step up the productivity of groundnut by adopting improved practices as also by increasing irrigation facilities.

Chandravel (2012) compliance with food safety and other standards is critical for ground nut trade. In India while the acreage of ground nut is large, productivity is one of the lowest in the world. Therefore, there is a need to give a major thrust on developing ground nut varieties which are high yielding and promising in less – fertile regions and moisture stress conditions.

K.M.Shajehan joint director of Agriculture (2013) said ground nut is raised on 10,000 hectares under irrigated method and 8000 hectares under rain fed method.

The groundnut is the worlds 13th most essential food gather. Among number of oilseeds, groundnut production is higher as 25% than others. They also explained about the importance of ARIMA model – Auto-regressive integrated moving average. It was discovered by Box and Jenkins (1970). It is an effective, robust method which is used to forecast with minimum forecast error. Many have used ARIMA MODEL to forecast the production of rice, milk production etc. ARIMA is an statistical tool for analysing a variety of types of time series data. Data is collected from India's MOSPI Statistics Yearbook. It contains a annual groundnut production since 2003-2004 to 2017-2018.The model was validated by the authors using 15 years of groundnut production data. The authors explained about the procedure and methodologies to be followed in ARIMA Model. The ARIMA model is based on Jenkins process. ARIMA processes can be used to represent all stationary time series as long as the required order of p and q for AR and MA components is maintained.

The authors selected states on the basis of their average groundnut production from the year 2017-18 to 2019-20.The selected states were Gujarat, Rajasthan, Tamil Nadu, Andhra Pradesh and Karnataka. Data were collected about area, production, productivity of groundnut from 2002-03 to 2019-20 from Directorate of Economics and Statistics .Materials and methods like Compound growth rate analysis and instability index were used to obtain the results. The analysis uses a time series analysis to comprehend groundnut crops past behaviour. This research

article is focuses on trend analysis of the groundnut area, production, productivity of major groundnut producing states of India. Gujarat showed negative growth rate in groundnut area at 1.564% per annum with 1 % level of significance and low rate of instability (9.690%) during the study period.

The authors studied about the importance of location-specific cultural practices and ways to increase and sustain groundnut production and yield in the country.The authors studied the trends in area,production,and yield of groundnut,its relatively profitability and factors affecting productivity in the state.This study is based on the primary data collected through field survey.The authors used exponential growth function to estimate the area,production and productivity of groundnut in India and Tamil Nadu and then the compound growth rate was obtained for logarithmic form. The authors used tabular representation to assess the costs, returns and profits of crops in the study area. They also used marginal value product and regression analysis.
They divided the study periods into two periods – pre form (1970-1991) and post reform (1992-2016).The results were the compound growth rate of area and production of groundnut was positive but not during pre-reform period.It was negative and 10% level during post-reform period.This indicates that groundnut area is declining which leads to decline in the production of groundnut in Tamilnadu.The resource use efficiency was based on the marginal value productivity of the variables for groundnut crop.MVP for all inputs were positive.Their final conclusion inferred is spending more on plant protection measures and human labour would be worth to further enhance the productivity of groundnut crop.

Groundnut (Arachis hypogaea L.) is an important oilseed crop grown worldwide, including Tamil Nadu, India. This research article presents a comprehensive review of the current status of groundnut productivity in Tamil Nadu, focusing on various aspects such as cultivation practices, challenges faced by farmers, recent technological advancements, and future prospects. The review integrates findings from recent studies, government reports, and expert opinions to provide a holistic understanding of the groundnut farming landscape in the region.
Tamil Nadu, situated in the southern part of India, is one of the leading producers of groundnut in the country. Groundnut cultivation in Tamil Nadu is primarily concentrated in regions such as the Cauvery Delta, the coastal districts, and parts of the Western Ghats. The crop plays a vital role in the state's agricultural economy, providing livelihoods to thousands of farmers and contributing significantly to the overall agricultural output.
Groundnut cultivation in Tamil Nadu follows diverse agronomic practices depending on factors such as soil type, climate, and available resources. Farmers typically grow groundnut as a by6njuki +rainfed or irrigated crop, with sowing predominantly taking place during the monsoon season. Varieties like TMV 2, TMV 7, and Kadiri 6 are commonly cultivated in the state due to their adaptability to local agro-climatic conditions.
Despite its importance, groundnut cultivation in Tamil Nadu is beset by various challenges that hinder productivity and profitability. One significant challenge is the prevalence of diseases such as rust and aflatoxin contamination, which not only reduce yields but also pose health risks to consumers. Additionally, erratic weather patterns, water scarcity, and pest infestations further exacerbate the difficulties faced by farmers.
In recent years, efforts have been made to enhance groundnut productivity in Tamil Nadu through the adoption of modern agricultural technologies and practices. This includes the promotion of high-yielding varieties, precision farming techniques, integrated pest management (IPM), and efficient irrigation methods like drip irrigation. Furthermore, the dissemination of knowledge and best practices through agricultural extension services and farmer training programs has contributed to improving crop management practices.
Despite the existing challenges, there are promising prospects for enhancing groundnut productivity in Tamil Nadu. Continued research and development initiatives aimed at developing disease-resistant varieties, sustainable farming practices, and value-added products could significantly boost the profitability and sustainability of groundnut cultivation in the region. Moreover, the integration of digital technologies and data-driven approaches holds the potential to revolutionize agricultural practices and mitigate the impact of environmental and socio-economic factors on crop yields.

Climate change poses significant challenges to agricultural systems globally, affecting crop productivity, food security, and livelihoods. Groundnut (Arachis hypogaea L.) is a vital crop in India, both economically and nutritionally. This research article employs modeling techniques to assess the potential impacts of climate change on groundnut production in India and evaluates adaptation strategies to mitigate these impacts. The study integrates climate data, agronomic models, and socioeconomic factors to provide insights into future groundnut production scenarios and inform policy and adaptation measures.

India is one of the largest producers of groundnut globally, with millions of farmers dependent on it for their livelihoods. However, climate change poses a considerable threat to groundnut production in the country, with rising temperatures, altered precipitation patterns, and increased occurrence of extreme weather events impacting crop yields and quality. Understanding the potential impacts of climate change and identifying effective adaptation strategies are crucial for ensuring the resilience and sustainability of groundnut farming systems in India.

This study employs a combination of climate models, crop simulation models (such as DSSAT - Decision Support System for Agrotechnology Transfer), and socioeconomic analysis to assess the vulnerability of groundnut production to climate change. Historical climate data and future climate projections are used to simulate the potential impacts on groundnut growth, development, and yield under different climate scenarios. Additionally, adaptation strategies, including changes in planting dates, crop varieties, irrigation practices, and management techniques, are evaluated for their effectiveness in reducing climate risks and enhancing groundnut productivity.

The modeling results indicate that climate change is likely to have varying impacts on groundnut production across different regions of India. While some areas may experience yield declines due to heat stress and water scarcity, others could benefit from changes in temperature and precipitation patterns. Adaptation strategies such as the introduction of heat-tolerant varieties, improved water management, and diversification of cropping systems show potential for mitigating the negative effects of climate change and improving overall farm resilience.

In conclusion, climate change poses significant challenges to groundnut production in India, but proactive adaptation measures can help mitigate its adverse effects and build resilience in agricultural systems. By integrating climate science, agronomic modeling, and socioeconomic analysis, this study provides valuable insights into the potential impacts of climate change on groundnut production and identifies adaptation pathways for enhancing farm productivity and livelihoods.

Groundnut (Arachis hypogaea L.) is a significant crop in India, both in terms of its economic importance and its nutritional value. This research article presents a trend analysis of the area under cultivation, production, and yield of groundnut in India over a specified time period. Drawing on secondary data sources, statistical methods are employed to examine the patterns and dynamics of groundnut farming in the country. The study sheds light on the factors influencing groundnut cultivation and offers insights into the challenges and opportunities for enhancing productivity and sustainability in the sector.

India is one of the largest producers of groundnut globally, with the crop grown in various agro-climatic zones across the country. Groundnut cultivation in India is characterized by diverse agronomic practices and socio-economic factors, making it an interesting subject for trend analysis. This study aims to analyze the trends in groundnut cultivation, focusing on the area under cultivation, production volumes, and yield levels. Understanding these trends is essential for formulating policies and interventions to support groundnut farmers and promote sustainable agricultural development.

The study employs a combination of descriptive statistics and trend analysis techniques to analyze the historical data on groundnut cultivation in India. Data on the area under cultivation, production quantities, and yield levels are collected from secondary sources, such as government agricultural statistics and research publications. Time-series analysis methods, including moving averages, linear regression, and trend extrapolation, are used to identify patterns and trends in groundnut farming over the selected time period.

The trend analysis reveals interesting insights into the dynamics of groundnut cultivation in India. It identifies periods of growth and stagnation in the area under cultivation, production volumes, and yield levels. Factors such as changes in agricultural policies, market dynamics, technological advancements, and climate variability are found to influence the trends observed in groundnut farming. The study also highlights regional variations in groundnut cultivation trends, reflecting the diverse agro-ecological conditions and socio-economic contexts across different states in India.

Groundnut (Arachis hypogaea L.) is a vital crop in India, contributing significantly to the country's agricultural economy and food security. This research article presents an econometric analysis of groundnut markets in India, focusing on price dynamics, supply-demand relationships, and factors influencing market integration. Utilizing time-series and panel data econometric techniques, the study examines the determinants of groundnut prices and explores the efficiency of market mechanisms in responding to supply and demand shocks. The findings provide valuable insights for policymakers, traders, and stakeholders involved in groundnut marketing and trade.

Groundnut is one of the major oilseed crops in India, cultivated across diverse agro-climatic regions. The groundnut market plays a crucial role in the agricultural economy, affecting farmers' incomes, consumer prices, and overall food security. Understanding the dynamics of groundnut markets is essential for effective policy formulation, risk management, and market interventions. This study aims to conduct an econometric analysis of groundnut markets in India, examining price transmission mechanisms, market integration, and the factors influencing market performance.

The study employs both time-series and panel data econometric techniques to analyze groundnut market dynamics in India. Time-series models, such as Vector Autoregression (VAR) and Error Correction Models (ECM), are used to examine price relationships and dynamics within domestic markets and between major producing and consuming regions. Panel data models, including Fixed Effects and Random Effects models, are employed to investigate the determinants of groundnut prices, considering factors such as production, consumption, trade, and policy variables.

The econometric analysis yields several important findings regarding groundnut market dynamics in India. Firstly, the study identifies the presence of price transmission mechanisms across different levels of the supply chain, indicating the extent to which changes in farm gate prices are transmitted to wholesale and retail markets. Secondly, factors such as production levels, weather conditions, international prices, government policies, and market infrastructure are found to significantly influence groundnut prices and market integration. Thirdly, the study highlights the importance of policy interventions, market reforms, and infrastructure development in enhancing market efficiency and reducing price volatility.

CONCLUSION

Groundnut (Arachis hypogaea L.) is a significant crop in India, both in terms of its economic importance and its nutritional value. This research article presents a trend analysis of the area under cultivation, production, and yield of groundnut in India over a specified time period. Drawing on secondary data sources, statistical methods are employed to examine the patterns and dynamics of groundnut farming in the country. The study sheds light on the factors influencing groundnut cultivation and offers insights into the challenges and opportunities for enhancing productivity and sustainability in the sector.

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